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(72) Inventors:  
 • Greig, Kevin  
 Leesburg, IN 46538 (US)  
 • Zwirkoski, Paul A.  
 Brighton, MI 48116-153 (US)  
 • Mears, Dana  
 Londonville, NY 12211 (US)

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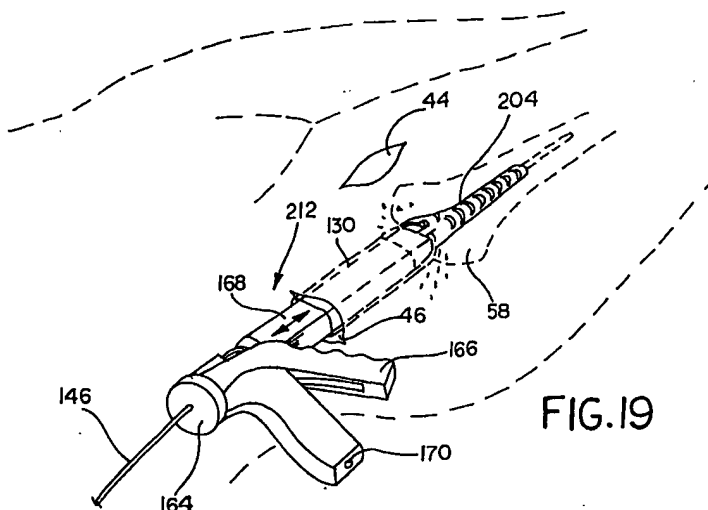
(71) Applicants:  
 • Bristol-Myers Squibb Company  
 New York, N.Y. 10154 (US)  
 • Mears, Dana  
 Londonville, NY 12211 (US)

(74) Representative: **Mays, Julie**  
**Barker Brettell,**  
**10-12 Priests Bridge**  
**London SW15 5JE (GB)**

(54) **Apparatus for performing a minimally invasive total hip arthroplasty**

(57) A method and apparatus for performing minimally invasive total hip arthroplasty are disclosed. Through an anterior incision (44), the femoral neck (60) is severed using an osteotomy guide (78), the acetabulum (54) is prepared, and an acetabular cup is inserted. An awl (106) is provided to locate a posterior incision (46) aligned with the axis of the femoral shaft (62)

through which the femur is prepared using a tubular posterior retractor (122), a reamer (151) and a rasp (204) with a lockable handle (212), to which a provisional femoral head and a selectively lockable provisional neck (222) are attached. The rasp is then removed and the femoral implant (238) is inserted in a bag (242) to keep it clean. Procedures performed through one incision may be observed through the other



**FIG. 19**



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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	FR 2 775 889 A (A.GRENIER) 17 September 1999 (1999-09-17) * page 6, line 5 - page 7, line 7; figures 2,3 *	1-3,27	A61B17/17 A61B17/16 A61B17/02 A61F2/46
X	US 4 627 425 A (H.W.REESE) 9 December 1986 (1986-12-09) * column 3, line 46 - line 47; figures 2,4E *	1-3,27	
X	US 4 621 630 A (R.V.KENNA) 11 November 1986 (1986-11-11) * column 4, line 8 - line 42; figure 1 *	1,27	
X	US 5 049 149 A (J.SCHMIDT) 17 September 1991 (1991-09-17) * column 4, line 1 - line 19; figure 1D *	1,27	
X	US 5 490 852 A (S.N.AZER) 13 February 1996 (1996-02-13) * figures 1,2 *	4,5,27	
X	US 5 624 447 A (R.K.MYERS) 29 April 1997 (1997-04-29) * abstract; figures * * column 4, line 47 - line 67 * * column 5, line 24 - line 42 *	6,7,9, 10,27	TECHNICAL FIELDS SEARCHED (Int.Cl.7) A61B A61F
X	EP 0 086 883 A (C.PICHEL MOURE) 31 August 1983 (1983-08-31) * page 12, steps 6-7 of the method * * page 12 - page 13, steps 9-10 of the method * * figures *	6,7,9, 10,27	
X	US 5 443 469 A (A.L.SMITH) 22 August 1995 (1995-08-22) * the whole document *	6,7,9, 10,27	
The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>12 November 2002</b>	Examiner <b>Nice, P</b>
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons &amp; : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03.82 (P04/001)



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**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

**LACK OF UNITY OF INVENTION**

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



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# EUROPEAN SEARCH REPORT

Application Number  
EP 01 30 3823

DOCUMENTS CONSIDERED TO BE RELEVANT				
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)	
X A	US 5 089 003 A (T.W.FALLIN AND J.H.KANG) 18 February 1992 (1992-02-18) * abstract; figures 1,3,4A-D * * column 1, line 6 - line 22 * * column 2, line 20 - line 26 * * column 3, line 48 * * column 4, line 9 - line 27 * * column 5, line 9 - line 18 *	15-22,24 23,25,26		
X A	US 5 190 550 A (G.J.MILLER AND M.LYONS) 2 March 1993 (1993-03-02) * abstract; figures 1,4 * * column 1, line 40 - line 41 *	15-22, 24,27 23,25,26		
X Y A	US 5 089 004 A (R.G.AVERILL AND R.C.COHEN) 18 February 1992 (1992-02-18) * column 5, line 17 - line 29; figure 5 *	24,25,27 26 23		
X A	US 4 552 136 A (R.V.KENNA) 12 November 1985 (1985-11-12) * column 4, line 43 - line 59; figures 1,9 *	24,25,27 23,26		TECHNICAL FIELDS SEARCHED (Int.Cl.7)
X A Y	US 4 765 328 A (P.J.KELLER AND R.C.COHEN) 23 August 1988 (1988-08-23) * column 4, line 19 - line 32; figure 5 * EP 0 558 203 A (DOW CORNING WRIGHT) 1 September 1993 (1993-09-01) * abstract * * column 3, line 31 - line 43 * * column 3, line 52 - column 4, line 25 *	24,25,27 23,26 26		
The present search report has been drawn up for all claims				
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>12 November 2002</b>	Examiner <b>Nice, P</b>	
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons &amp; : member of the same patent family, corresponding document</p>				

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**LACK OF UNITY OF INVENTION  
SHEET B**

Application Number  
**EP 01 30 3823**

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

**1. Claims: 1-14**

**Equipment for hip replacement through two small incisions**

**2. Claims: 15-27**

**Detachable handle and provisional femoral neck both  
attachable to a rasp**

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
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12-11-2002

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
FR 2775889	A	17-09-1999	FR 2775889 A1	17-09-1999
US 4627425	A	09-12-1986	US 4750481 A	14-06-1988
US 4621630	A	11-11-1986	AT 28557 T	15-08-1987
			AU 550596 B2	27-03-1986
			AU 2681484 A	18-10-1984
			CA 1232507 A1	09-02-1988
			DE 3465011 D1	03-09-1987
			EP 0122669 A1	24-10-1984
			ES 531542 D0	01-09-1985
			ES 8507341 A1	16-12-1985
			IE 55197 B1	20-06-1990
			IL 71541 A	31-03-1989
			JP 1480759 C	10-02-1989
			JP 59200643 A	14-11-1984
			JP 63029546 B	14-06-1988
			ZA 8402770 A	29-01-1986
US 5049149	A	17-09-1991	DE 3842645 A1	28-06-1990
			CA 2005464 A1	14-06-1990
			EP 0374086 A1	20-06-1990
			JP 2271848 A	06-11-1990
US 5490852	A	13-02-1996	NONE	
US 5624447	A	29-04-1997	NONE	
EP 0086883	A	31-08-1983	ES 507900 D0	16-01-1983
			ES 8302447 A1	16-04-1983
			EP 0086883 A1	31-08-1983
			JP 58127628 A	29-07-1983
US 5443469	A	22-08-1995	NONE	
US 5089003	A	18-02-1992	NONE	
US 5190550	A	02-03-1993	US 5190549 A	02-03-1993
US 5089004	A	18-02-1992	NONE	
US 4552136	A	12-11-1985	AT 34519 T	15-06-1988
			CA 1254470 A1	23-05-1989
			DE 3471441 D1	30-06-1988
			EP 0139520 A2	02-05-1985
			ES 292576 U	16-06-1986

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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ON EUROPEAN PATENT APPLICATION NO.**

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The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

12-11-2002

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4552136	A		JP 1512176 C	09-08-1989
			JP 60111652 A	18-06-1985
			JP 63059703 B	21-11-1988
US 4765328	A	23-08-1988	NONE	
EP 0558203	A	01-09-1993	CA 2089720 A1	21-08-1993
			EP 0558203 A1	01-09-1993
			JP 5277142 A	26-10-1993
			US 6432110 B1	13-08-2002

